Dec. 30, 1930. W. GREIM 1,786,991

WOODEN CONSTRUCTION

Original Filed Oct. 18, 1927

Fig. 1

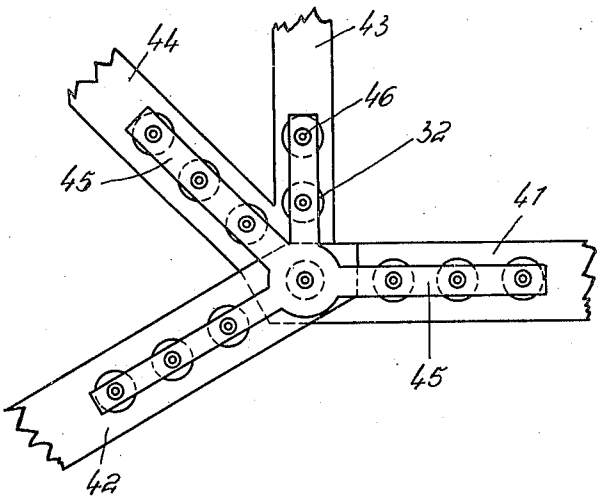


Fig. 2

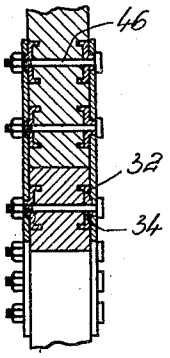


Fig. 3

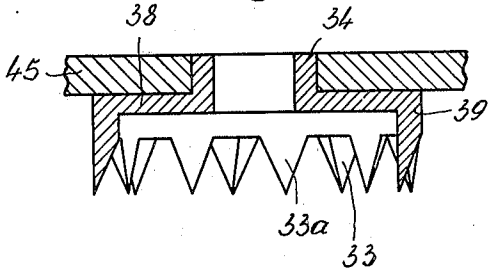
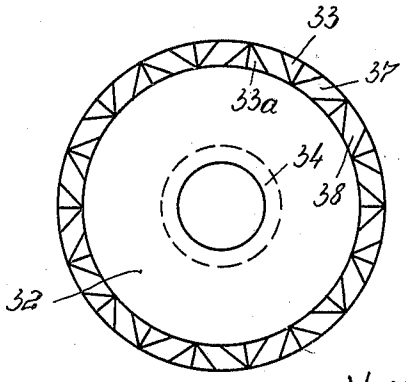


Fig. 4



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UNITED STATES PATENT OFFICE

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WOODEN CONSTRUCTION

Original application filed October 18, 1927, Serial No. 226,990, and in Germany June 11, 1926. Divided and this application filed August 20, 1928. Serial No. 300,833.

My invention relates to wooden constructions such as wooden trusses or lattice girders, and particularly to such constructions, in which the bars are to be provided with iron straps or gusset plates for connecting them in a tension and compression resisting manner in assemblage or junction points.

It has heretofore been proposed to attach straps or similar metal or wooden junction elements to wooden beams by pronged discs or claw plates having lateral teeth, these teeth being capable of acting as a plurality of dowels and being so formed that their roots are sloping and are provided with radially directed surfaces, whilst the head, of quadrangular pyramid form, ends in a blunt edge, which owing to the sloping of the head, tends to lie alternately on the inside and on the outside of the edge of the ring or plate. In the preferred embodiment of the present invention, however, the claw plates are provided with teeth shaped in a manner such as is hereinafter set forth, which makes possible a clamping of the wood fibres in the grooves, bounded by the teeth, at each portion of the circumference of the claw plate and which also provides the greatest possible surfaces of contact at the inner and outer surfaces of the claw plate, which enables such fittings to withstand great pressure against the wall of the bolt hole.

In the accompanying drawings

Fig. 1 represents a side-elevation of a junction point of wooden beams provided with lateral gusset plates and pronged discs.

Fig. 2 represents a central vertical section through this joint, and

Figs. 3 and 4 show a preferred prong plate in cross-section and bottom view respectively.

Referring to Figs. 1 and 2 of the drawings it will be observed that two lower bars 41, 42, a post 43 and a strut 44 converge toward the joint formed by gusset plates or straps 45 which are laterally arranged on the beams and connected by screw bolts 46 traversing the wooden beams and the gusset plates. These straps 45 are attached to the beams by means of prong plates 32 having hubs 34 which project as hollow bosses into holes of the straps and serve at the same for the reception of the tie bolts 46.

As particularly clearly shown in Figs. 3 and 4 each prong plate consists of a disc 32 provided on one side with a hub 34 and on the other side with an annular flange 39 having two groups of prongs 33 and 33*a*. The prongs have the shape of a triangular pyramid, the prongs of one group alternating with those of the other. Group 33 has its prongs arranged so that one pyramid side coincides completely or substantially so with the outer periphery of the flange 39 and one pyramid side of the adjacent prongs of group 33*a* coincides completely, or substantially so with the inner periphery of flange 39. In this way the prongs confine spaces 37 and 38 between them which are located tangentially to an inscribed circle. The individual pronged plates are countersunk into prepared recesses in the timbers to a depth equal to the cylindrical length of the disc which terminates at the roots of the prongs and are then driven in until the outer face upon which the hub 34 is seated is flush with the surface of the timber.

This design of the pronged plates and in particular the arrangement of the prongs presents special advantages in regard to the transmission of the forces. Due to the fact that the outer faces of outer teeth 33 and the inner faces of the inner teeth 33*a* are in their full width located concentrically to the axis of the plate or to the connecting bolt, the connection provides a great frictional pressure in the holes and relieves bending stresses on the tie bolts 46. On the other hand channels are formed owing to the oblique direction of the prong surfaces in which the fibres of the timber along the entire circumference of the disc can be engaged by the prongs and firmly clamped at a slight deflection from the direction of the grain of the wood.

The cooperation of a pronged plate as described with a connecting strap or plate fitting over its hub or eye increases the stress resisting capacity of the combination due to the clamping of the wood fibres between the prongs of the pronged plate and ensures a direct transmission of the stresses by the con-

nection of all the pronged plates with the straps.

It is of course immaterial for the nature of my invention, whether the interengagement of the pronged plates and the connecting straps is effected by hubs or eyes 34 provided upon the pronged plates as shown, or whether the straps are provided with hubs and corresponding recesses for the hubs are provided in the pronged plates.

Various modifications and changes may be made without departing from the spirit and the scope of the invention, but what I claim is

1. In combination with wooden structures such as wooden trusses or lattice girders, pronged plates for bolting straps or similar metal parts to wooden beams, or timbers, each prong plate consisting of a disc provided at one side with a hub adapted to receive a connecting screw bolt, and at the other side with an annular flange serrated to form prongs having the shape of triangular pyramids arranged in two groups and being alternately so placed that one pyramid side of the prongs of one group coincides with the outer periphery of the flange and one pyramid side of the adjacent prongs coincides with the inner periphery of said flanges.

2. In combination with wooden structures such as wooden trusses or lattice girders, pronged plates for bolting straps or similar metal parts to wooden beams or timbers, each pronged plate consisting of a disc provided at one side with a hub adapted to receive a connecting screw bolt, and at the other side with an annular flange having prongs formed in the shape of triangular pyramids, each prong being offset at an angle with respect to its adjacent prongs so that interstitial spaces are formed between said prongs which are directed in tangents to a circle located between said annular flange and said hub.

3. A structural junction element for wooden structures, comprising a stress transmitting disc having a central bolt hole and being recessable into the wood and having axially directed pyramidally shaped prongs arranged on its periphery, the pyramid points of said prongs being alternately offset in radial direction with respect to the disc center, to form two circles of points with two disc radii of different lengths, the axial directions of the interstitial spaces between adjacent prongs being located on lines traversing the disc between its center and its periphery.

4. A structural junction element for wooden structures, comprising a stress transmitting disc having a central bolt hole and being recessable into the wood and having axially directed pyramidally shaped prongs arranged on its periphery, the pyramid points of said prongs being alternately offset in radial direction with respect to the disc center, to form two circles of points with two disc radii of different lengths, the axial directions of the interstitial spaces between adjacent prongs having the directions of tangents on a circle located inside of the disc periphery.

5. A structural junction element for wooden structures, comprising a stress transmitting disc having a central bolt hole and being recessable into the wood and having axially directed pyramidally shaped prongs arranged on its periphery, the pyramid points of said prongs being alternately offset in radial direction with respect to the disc center, to form two circles of points with two disc radii of different lengths, the axial directions of the interstitial spaces between adjacent prongs being located on lines traversing the disc between its center and its periphery, and a stress transmitting central boss on said disc, adapted to engage the structure to which the wood is connected.

6. A structural junction element for wood structures, comprising a stress transmitting disc having a central bolt hole and being recessable into the wood and having axially directed prongs shaped as three-sided pyramids arranged on the disc periphery with their points alternately offset in radial direction to form two circles of points with two disc radii of different lengths, whereby interstitial spaces are formed between adjacent prongs whose axes are located on tangents to a circle located inside of the disc periphery.

In testimony whereof I affix my signature.

WALTHER GREIM.